



PROJECT PROFILE

TORSION STRESS ANALYSIS OF CSST GASLINE

CLIENT CHALLENGES

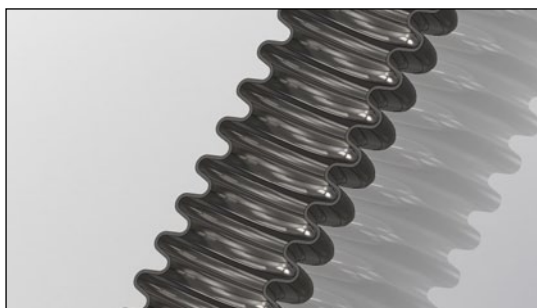
Our client develops commercial cooking equipment that is shipped around the world. They used a CSST (corrugated stainless steel tubing) gasline in certain gas stove assemblies. A small number of field failures occurred with no clearly identifiable reason. They suspected the amount of torque applied to the tube in its installed state was a significant contributing factor to the failure. Of interest was determining what maximum assembly torque could safely be applied. Palladium was asked to review and assist the client as follows:

- Estimate the magnitude and location of the highest internal stresses that develop in the assembled tube under a variety of torque only conditions;
- Estimate the angle of twist that causes damage to the tube;
- Suggest potential solutions to the part failure problem.

SOLUTION

Palladium personnel were utilized for expertise in the analysis field. The following tasks were performed to successful project completion:

- Collection of part manufacturing drawings and accurate material data.
- Modelling of an accurate as manufactured 3d CAD CSST tube.
- Surface mesh creation.
- Assessment of accurate part constraints and pre-loading as they exist in the final assembled system.
- Calculation of static torsion loading condition stresses under a range of torques.
- Check for conversion of results under variety of meshes.
- Check linear static results with non-linear analysis.
- Report to the client presenting the results of analysis.



PROJECT HIGHLIGHTS

Palladium personnel delivered the project within time and budget due to:

- Previous FEA modeling and analysis experience.
- Collaboration with suppliers to obtain truly representative material and dimensional data for the as manufactured tube.

The analysis results gave the client confidence to:

- Instigate production solutions to minimize the chance of future part failure.
- Instigate a pass/fail test for the assembled tube.

